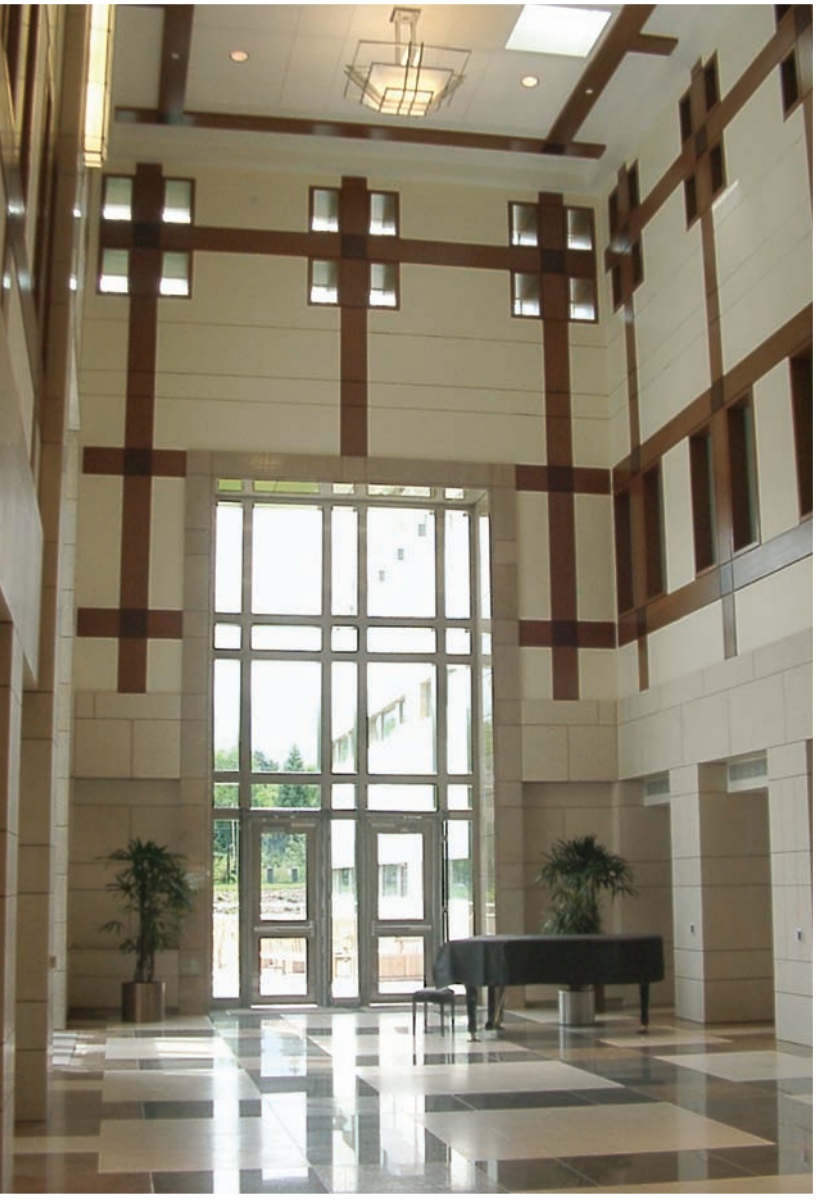
GREEN EMBASSIES

LEED CERTIFICATION FOR THE U.S. EMBASSY COMPOUND IN SOFIA, BULGARIA

BY DONNA MCINTIRE

Photos by U.S. Department of State, Overseas Buildings Operations.



The first LEED-Certified U.S. embassy occupies a 9.65-acre brownfield site in urban Sofia, Bulgaria. Since his appointment in 2001, Major General (Retired) Charles E. Williams, Director/COO of the U.S. Department of State (DoS), Bureau of Overseas Buildings Operations (OBO), has directed his organization to think innovatively and make sustainability part of the standards for embassy design. At Williams' direction, OBO builds, operates and maintains over 17,000 facilities in 263 countries, and has completed 42 New Embassy Compounds (NECs) during the past six years, moving roughly 14,000 employees into safer facilities. OBO hires American prime contractors with local subcontractors to execute and complete Design-Build contracts in an average period of 28-months (from award to occupancy), which is nearly half the industry standard schedule for this project type. In addition to this highly aggressive schedule, projects often face many significant challenges such as unskilled labor, lack of materials and infrastructure, and severe weather. The final challenge for all NEC projects is to earn LEED Certification.

The embassy in Sofia was the first U.S. Diplomatic compound to receive certification during Secretary Rice's quest for "transformational diplomacy."

The Sofia NEC earned the seven LEED version 2.0 prerequisites and 26 points in the following categories; Sustainable Sites - 7, Water Efficiency - 2, Energy & Atmosphere - 6, Materials & Resources - 1, Indoor Environmental Quality - 5. The four Innovation in Design points were earned for the following;

1. IDc1.1: Water Treatment — Pulsed-power technology was used as an alternative to standard chemical treatment of HVAC equipment process water, reducing scale build-up and yielding the following benefits and savings.

(a) Minimum energy savings of 5 percent compared to conventional chemical treatment due to elimination of biofilm (slime layer).

(b) Annual water savings of 12 percent, or 262,800, gallons when compared to a typical open system with conventional chemical treatment.

(c) Annual elimination of chemicals released from cooling tower: 1,050 pounds of chlorine (through evaporation) and 525,600 gallons of wastewater containing 20ppm phosphate, 2ppm zinc, and 1ppm chlorine (including disinfection byproducts).

The Clearwater Dolphin (www.clearwater-dolphin.com) is an electronic system that produces a pulsed, time-varying, induced electric field inside a PVC pipe that fits directly into the cooling tower's re-circulating water system. The electric signal changes the way minerals in the water precipitate, totally avoiding hard-lime scale by instead producing a non-sticking mineral powder in the bulk water. This powder and bacteria trapped in the powder are removed through filtration during normal blowdown, or settle loosely in the cooling tower basin for easy annual removal. Bacteria are injured by the electronic pulses and cannot reproduce, thus resulting in an exceedingly low bacteria population. Water softening is not necessary and high cycles of concentration are usually obtainable, leading to significant water conservation.

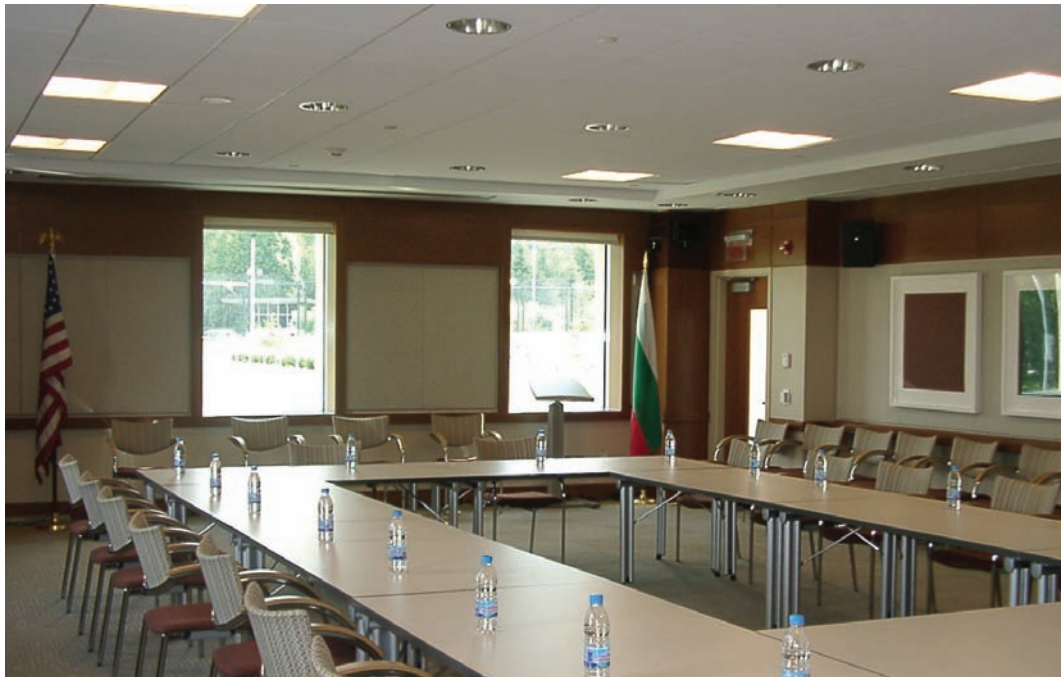
2. IDc1.2: Exemplary Performance in SSc5.2 — The NEC dedicated more than 2.3 acres (100,000 square feet — over twice the building footprint) of tree preservation and open space area for native and adapted species.

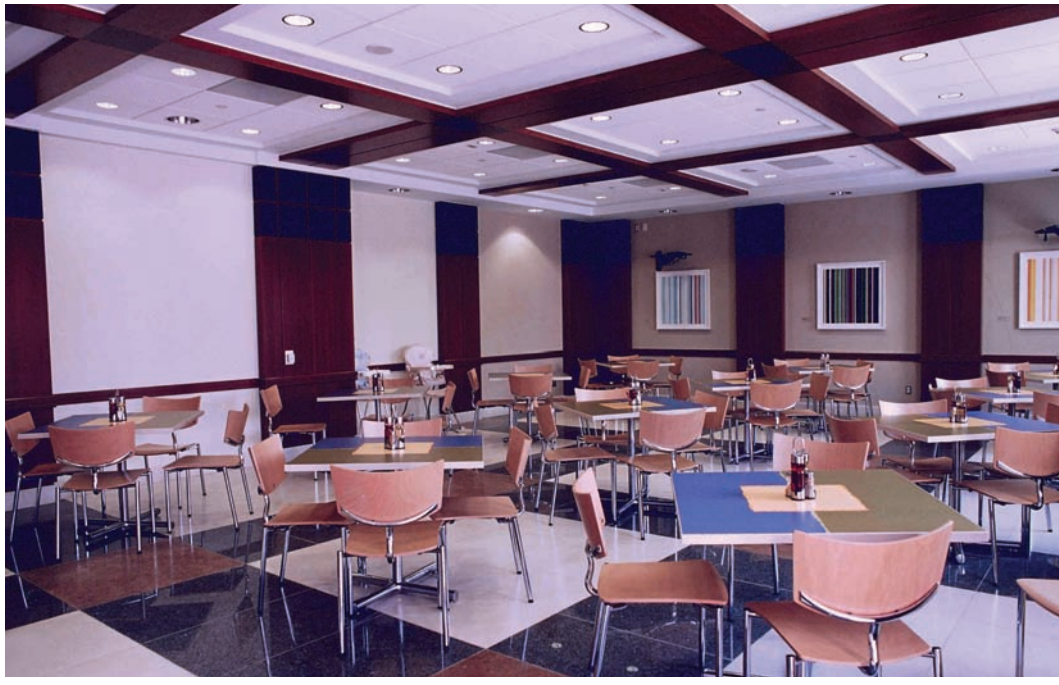
3. IDc1.3: Enhanced IAQ - LEED Prerequisite 1 — Minimum IAQ performance requires ASHRAE Standard 62-1999 including a minimum MERV 6 filter for standard commercial office systems. MERV 6 is capable of removing greater than 90 percent of particles in 3.0-10.0 micro-m, including: molds, spores dusts, etc. Sofia's system requires a MERV 17 filter, which removes greater than 99.97 percent of these particles plus those smaller particles including viruses, sea salt, combustion smoke, radon and radioactive particles. Sofia also includes additional ASZM-TEDA filtration, which

removes the same gases as standard carbon filters used in commercial office buildings as well as many gases that have been used in military warfare or terrorism.

4.IDc1.4: Building as an Educational Tool — The Design and Engineering Division produced an informative video, PowerPoint, brochure, and poster to educate employees and visitors on the sustainable features of new embassies and featured the achievements of Sofia. The video has been shown to multiple audiences via departmental broadcasts, seminars and Earth Day events. The posters are being mounted in the main circulation corridors and cafeteria of the building, and brochures were e-mailed and printed for distribution to all employees and available to visitors. The achievements of Sofia have been covered by ABC News; *Engineering News Record* (not yet published); and the U.S. Department of State's magazine featured the story in its May publication. The magazine distributes more than 34,000 copies to Congress, U.S. Embassies, universities, 8,500 government retirees, and every civil and foreign service employee overseas.

Green has gone mainstream at the Department. While the recognition of LEED Certification for Sofia is groundbreaking for OBO, high-performance building has been well





integrated into the project definition, budget, site selection, planning, design, and construction and commissioning phases of project development. During the past decade, OBO has found many synergies between its primary mission of security for American citizens and high-performance goals, such as optimizing energy, renewable energy, and water use reduction and treatment. Budgets for 2009 NEC projects are being established to include requirements to earn LEED Silver.

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